
PRESENTATION OF THE ACADEMY
MEDAL TO GEORGE K. HIRST, M.D.*

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SCIENCE is a rigorous and demanding taskmaster. Those who follow its pursuits usually find full reward in the task and its demands. But the approval and approbation of one's peers and colleagues is another kind of reward, which, while unsought, is no less gratifying. This approval, often unspoken, can be measured by acceptance of manuscripts, appointment to faculties, election to learned (or allegedly learned) societies, and the bestowal of grants. Then, there is the time—the rare time for most of us—for the award of prizes and medals. Usually such occasions are joyful ones, especially when the human and arbitrary decisions of nominating committees are as indisputable as they are tonight with the awarding of the Academy Medal to Dr. George Hirst.

Scientists come in all shapes and sizes, dispositions and indispositions. It must be admitted that there are some who not only do not shun the spotlight but who seek it, who see scientific accomplishment only as a prelude to the acquisition of power or social success. Antithetically, George Hirst is a scientist's scientist—a virologist's virologist—who is fidgeting at this moment behind me and probably is wondering when I'll get finished with what I have to say. Well, as a fellow virologist who has long stood in awe of him, for his sake I shall try to be as brief as possible, but the occasion demands at least a hasty reminder to this audience, and perhaps even to him, of why this award—given in this venerable and distinguished academy—is so well deserved.

George Hirst has been honored in this building before—with his presentation of the 1948 Harvey Lecture on "The Nature of Hemagglutination by Viruses." What an esoteric and unimportant topic! Or so thought many at the time, but not I, who sat in the audience as a new recruit to virology in the laboratory of Dr. Frank Horsfall at what was

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then known as the Rockefeller Institute. Fresh from the study of the 1947 epidemic of influenza at Fort Monmouth, I appreciated the diagnostic significance of Dr. Hirst's discovery in 1941 of the agglutination of erythrocytes by influenza virus. However, neither I nor anyone else then appreciated the ultimate significance of this simple observation, nor anticipated the degree of its subsequent exploitation for later investigations of virus-cell interaction and quantitative virology. But, unlike the descriptive scientist or phenomenologist, Dr. Hirst tenaciously seized this laboratory finding to extract from it its ultimate meaning. If one looked carefully one saw not only that red cells were agglutinated by influenza viruses but that this agglutination was transient and that the kinetics of disagglutination and the reaction of virus and red cell were reminiscent of enzyme-substrate reactions—that is, if one knew as much about enzymes and substrates as Dr. Hirst did. He established that the reaction following hemagglutination, the elution reaction, was mediated by enzymes and that the neuraminidase enzyme was an intrinsic part of the viral particle. These disarmingly simple observations simultaneously produced a model for the attachment of viruses to cells and demonstrated the first known viral enzyme. In the period of “me-too-ism” which inevitably follows simple but great scientific discoveries all kinds of viruses were mixed with all kinds of red cells (not excluding those of the giraffe) and the universality of the model became apparent. The exact mechanism of hemagglutination is still under study 34 years later, but the legacy of this contribution is enormous.

However, George Hirst's scientific reputation hardly rests on his discovery and elucidation of hemagglutination. Still exploring the vagaries of the influenza virus, Dr. Hirst confirmed Burnet's observations that genetic interaction might occur between influenza viruses; he then proceeded on a series of classical studies of the genetics of this important virus. I shall not describe these studies in detail, although they are so close to my own interests that I can hardly refrain. I shall only point out that once again his deliberate but imaginative pursuit of one virus established general principles applicable to many. Thus, Dr. Hirst and his associates established conclusively, through genetic and physico-chemical studies, that the genome of the virus occurred in pieces or segments and, thus, that genetic interaction between viral strains was facilitated. It is now recognized that a number of other viruses, includ-

ing some plant viruses, have such segmented genomes; the genetic implications once again are incalculable. On the basis of such studies the deliberate genetic manipulation of influenza viruses for the construction of better vaccines has already borne fruit.

The essence of science has always been communication, and the establishment of the journal *Virology* in 1955 under the editorship of George Hirst represented a landmark in communication among virologists. This journal exemplified what we have already seen as George Hirst's—shall I call it unitarian?—concept of virology, an idea hardly popular at the time. In retrospect it is now quite clear that the structure and chemical behavior of viruses of plants, animals, and bacteria have great overlap; hence they are properly presented together and not in separate esoteric journals. (To test this, ask an electron microscopist to distinguish reovirus of animals from wound tumor virus from plants.)

And yet, I almost forgot to mention that somehow in the middle of his pioneer work in laboratory investigations and the creation of a new journal, George Hirst found time, in 1956, to assume the directorship of the Public Health Research Institute of the City of New York, an institute which is now world-renowned for its work in various aspects of molecular biology.

In closing these altogether inadequate remarks, I recognize that I have said nothing about George Hirst the person. Perhaps this is because he is a very special, private, and complex man, not completely known even to those who have worked with him for many years. All his friends and colleagues to whom I have talked during the last few weeks in preparation for this occasion have expressed the strong feelings of admiration and respect which they have for him and have commented upon his delighted and sudden appreciation of things and people who somehow open doors of undiscovered knowledge to him. I myself have witnessed his insatiable curiosity about any new finding or any new scientific event, and it has been an inspiration to me. The breadth of George Hirst's knowledge is incredible and is not restricted to science. He is not only a musicologist but a musician. It is no anticlimax to add that George is also the complete handyman, gardener, and nature lover.

I feel honored and proud to be part of this ceremony and I apologize to Dr. Hirst for leaving out so many things, but I could not face him again if I talked any longer.

Congratulations, George, this honor is long overdue.